
NATIONAL AERONAUTICS
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SECTION 16288

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SECTION 16288

SURGE ARRESTERS
06/04

NOTE: Delete, revise, or add to the text in this
section to cover project requirements. Notes are
for designer information and will not appear in the
final project specification.

This section covers surge and lightning arresters of
the distribution, intermediate, and station types.
Drawings should show type, voltage, mounting, and
connection details.

PART 1 GENERAL

1.1 REFERENCES

NOTE: The following references should not be
manually edited except to add new references.
References not used in the text will automatically
be deleted from this section of the project
specification.

The publications listed below form a part of this section to the extent
referenced:

ASTM INTERNATIONAL (ASTM)

ASTM A 123/A 123M (2002) Standard Specification for Zinc
(Hot-Dip Galvanized) Coatings on Iron and
Steel Products

ASTM A 153/A 153M (2004) Standard Specification for Zinc
Coating (Hot-Dip) on Iron and Steel
Hardware

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C62.11 (1999) Standard for Metal-Oxide Surge
Arresters for Alternating Current Power
Circuits (>1kV)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA LA 1 (1992; R 1999) Surge Arresters

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70

(2002) National Electrical Code

1.2 GENERAL REQUIREMENTS

NOTE: If Section 16003 GENERAL ELECTRICAL PROVISION
is not included in the project specification,
applicable requirements therefore should be inserted
and the following paragraph deleted.

Section 16003 GENERAL ELECTRICAL PROVISIONS applies to work specified in
this section.

Equipment and Performance Data shall be submitted for surge arresters
including life, test, system functional flows, safety features, and
mechanical automated details.

1.3 SUBMITTALS

NOTE: Review submittal description (SD) definitions
in Section 01330 SUBMITTAL PROCEDURES and edit the
following list to reflect only the submittals
required for the project. Submittals should be kept
to the minimum required for adequate quality
control. Include a columnar list of appropriate
products and tests beneath each submittal
description.

The following shall be submitted in accordance with Section 01330 SUBMITTAL
PROCEDURES in sufficient detail to show full compliance with the
specification:

SD-02 Shop Drawings

Provide the following shop drawings according to requirements set
forth in this section:

Fabrication Drawings
Installation Drawings

SD-03 Product Data

Equipment and Performance Data shall be submitted for surge
arresters in accordance with paragraph entitled, "General
Requirements," of this section.

Manufacturer's product data shall be submitted for the following
items:

Surge Arresters
Mounting Brackets

SD-08 Manufacturer's Instructions

Installation Instructions
Surge Arresters

SD-10 Operation and Maintenance Data

O & M Manuals
Surge Arresters

PART 2 PRODUCTS

2.1 EQUIPMENT

Design, fabrication, testing, and performance of arresters shall comply with IEEE C62.11, NEMA LA 1.

NOTE: Voltage rating of arresters shall be in accordance with manufacturer's recommendations to meet the maximum continuous line-to-ground operating voltage (MCOV). System neutral, whether grounded, ungrounded, or effectively grounded for all possible conditions of operations, including Phase-to-ground faults, shall be considered when selecting arrestors.

Arrester shall utilize metal oxide varistor and gapped arrester technologies.

The arresters shall be contained within a polymer housing. The arrester shall be designed to be non-fragmenting to provide extra safety to personnel and equipment. Arresters utilizing a hanger frame type mounting bracket, the frame shall be non-corrosive track resistant glass filled polyester or other suitable non-corrosive/non-conductive material providing high mechanical strength. Arrester mounting hardware shall be designed for installation in severe salt-spray atmosphere and shall be of a corrosion-resistant metal or shall be zinc-coated in accordance with [ASTM A 123/A 123M] [ASTM A 153/A 153M].

2.2 FABRICATION DRAWINGS

Submit fabrication drawings in accordance with paragraph entitled, "Equipment," of this section. Drawings shall show assembly and fabrication details performed in the factory.

2.3 SURGE ARRESTERS

2.3.1 O & M Manuals, Surge Arresters

Provide O & M Manuals for surge arresters specified within these plans and specifications.

2.3.2 Distribution

Distribution arresters shall be combination spark gap and metal oxide varistor type. Mounting hardware shall be corrosion resistant.

2.3.2.1 Distribution - Riser-Pole Class

Distribution - Riser-Pole Class shall be combination spark gap and metal oxide varistor type. Mounting hardware shall be corrosion resistant.

2.3.3 Intermediate

Arresters shall be single-phase, single-pole, self-supporting type for pedestal, platform, or bracket mounting.

2.3.4 Station

Arresters shall be single-phase, single-pole, self-supporting type for pedestal, platform, or bracket mounting.

2.4 SURGE PROTECTION FOR ROTATING AC MACHINES

Arresters installed on rotating alternating current equipment shall be the type and rating as recommended by the manufacturer of the equipment.

2.5 MOUNTING BRACKETS

Arresters shall be equipped with suitable mounting brackets for the applicable method of mounting.

PART 3 EXECUTION

3.1 INSTALLATION

Arresters shall be installed and connected in accordance with the manufacturer's installation instructions.

Ground connection shall be made to a driven ground rod, counterpoise, or station grounding system and shall meet the intent of the National Electrical Code, NFPA 70.

Lightning arresters shall be connected as close as practicable to the apparatus being protected. When connecting arresters to overhead conductors, a hot line clamp shall be used. The hot line clamp shall be so designed to be compatible to the type of conductor material being used, i.e. aluminum or copper.

3.1.1 Installation Instructions, Surge Arresters

Manufacturer's instructions shall be submitted for surge arresters including special provisions required to install equipment components and system packages. Special notices shall detail impedances, hazards and safety precautions.

3.1.2 Installation Drawings

Submit installation drawings in accordance with paragraph entitled, "Installation," of this section.

3.2 ARRESTERS

3.2.1 Distribution Type

Distribution class arresters shall be installed on all overhead lines,

riser poles, pad mounted transformers and where applicable installed on distribution load break switches, sectionalizers and fault interrupters.

3.2.1.1 Distribution - Riser-Pole Class

Distribution - Riser-Pole class arrestors shall be installed on all riser poles.

3.2.2 Intermediate Type

NOTE: Where additional protection is necessary, intermediate class arresters shall be installed. Utilization of intermediate class arresters shall take into consideration the increased size, weight and mounting constraints. Typical areas of consideration are unit substations, primary switches and switching stations.

Install intermediate type arrestors on grounded support brackets/structures suitable to adequately support the weight of the arrestor.

Install intermediate type arrestors on grounded support brackets/structures suitable to adequately support the weight of the arrestor.

3.2.3 Station Type

NOTE: Where maximum protection is required the station class arrester shall be utilized. These arresters shall be used where switching surge durability is required. A typical area of utilization is utility substations where the medium voltage distribution system interfaces to the high voltage commercial power provider. Utilization of station class arresters shall take into consideration the increased size, weight and mounting constraints.

Install station type arrestors on grounded structures suitable to adequately support the weight of the arrestor.

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